Alberta's River Water Quality Monitoring Programs

Background

Alberta Environment and Parks (AEP) is dedicated to ensuring healthy, secure and sustainable water supplies for our communities, environment and economy. To support this objective, AEP has two core river water quality monitoring programs: the Long-Term River Network (LTRN) and the Tributary Monitoring Network (TMN).

LTRN sites are typically located on major rivers of particular importance to Albertans and drain large areas of the province. The TMN program augments LTRN data by monitoring smaller tributaries of major rivers that are more closely connected to the landscapes they drain.

LTRN and TMN programs generate surface water quality data that is critical for the responsible stewardship of Alberta's water resources. For example, surface water quality data are used in water quality management frameworks, cumulative effects management, condition of environment reporting, and long-term trend analyses. Additionally, multiple stakeholder groups (e.g. industry, academia, non-profits, etc.) utilize the data for their own planning, assessment and reporting initiatives.

Overview

- Two core AEP river water quality monitoring programs

- 36 Long-Term River Network Sites on major rivers

- 70+ Tributary Monitoring Network Sites on smaller tributary rivers and streams

- Nutrient, major ions, metals, and other parameters monitored monthly across Alberta

- Data from Alberta's water quality monitoring programs is important for the stewardship of Alberta's surface water resources

Long-Term River Network

The primary purpose of the LTRN program is to enhance understanding of broad water quality conditions across Alberta and assess the cumulative effects of multiple land-use activities on surface water quality. The LTRN program has been sampling surface water in major rivers across Alberta since the 1970s. Over the last several decades, the LTRN program has expanded to include 36 sites across ten watersheds (Figure 1).
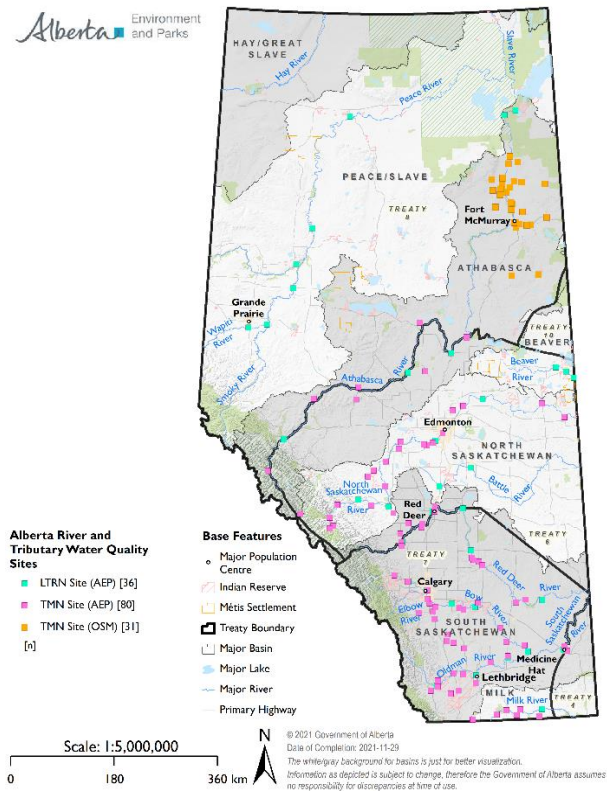
Alberta

Figure 1: Current LTRN and TMN Sampling locations

Tributary Monitoring Network

The primary purpose of the TMN program is to samples surface water in smaller tributaries of major rivers to better understand environmental change associated with activities such as forestry, agriculture, urbanization, resource extraction, and climate change.

Although water quality samples have been collected sporadically from tributaries since the 1960s, the TMN program was initiated in 2016 to provide consistent and comprehensive information on the quality of surface water in smaller, typically wadable rivers and streams not currently sampled by the LTRN program (Kerr and Cooke, 2019).

The TMN program initially included over 70 sites in Southern Alberta and the Upper Athabasca River watershed (Figure 1). The Lower Athabasca River is monitored separately under the Oil Sands Monitoring program. An expansion of the TMN program into the North Saskatchewan River Basin

occurred through a partnership with EPCOR, the City of Edmonton, and the North Saskatchewan Watershed Alliance.

Approach

Sampling protocols for the LTRN and TMN programs focus on the monthly collection of one litre grab samples of surface water with more information provided in AEP (2006) *Aquatic Ecosystems Field Sampling Protocols*.

In general, the parameters monitored include nutrients, metals (total recoverable and dissolved), major anions and cations, and general sampling parameters. A full list of water quality parameters that are monitored for as part of the core AEP river monitoring program is included in Table A2 in Kerr and Cooke (2019). Pesticides and organic parameters are also measured at select LTRN stations for specific time periods to support enhanced reporting requirements on major rivers.

An AEP river quality control (QC) program established in 2016 monitors the quality of data generated by the LTRN and TMN programs. In particular, field blanks and duplicate samples are used to assess the quality of data generated by these programs (e.g. Laceby et al. 2022).

Summary

High-quality data collected from the range of Alberta's rivers and streams is one of the key products of the LTRN and TMN programs in order to support decision making and the stewardship of surface water resources. Data generated by the AEP river monitoring programs also provides the foundation for provincial planning, evaluation and reporting products along with peer-reviewed publications and other research and industry outputs.

Figure 2. Example of a surface water quality sampling location on the Siffleur River in the North Saskatchewan River Basin. (Credit: C. Emmerton)

For more information, please consult:

Kerr, J. G. and C. A. Cooke. 2019. A five-year provincial water quality monitoring, evaluation and reporting plan for lotic systems. Government of Alberta, Ministry of Environment and Parks. ISBN 978-1-4601-4136-6. Available at: https://open.alberta.ca/publications/9781460141366.

AEP, 2006. Aquatic Ecosystems Field Sampling Protocols, Alberta Environment and Parks (AEP), Edmonton, Canada. Available at: https://open.alberta.ca/publications/077855080x.

Laceby, J.P., Chung, C., Kruk, M.K., and Kerr, J.G. 2022. Evaluation of quality control data from Alberta's lotic water monitoring programs, 2016-19. Government of Alberta, Ministry of Environment and Parks. ISBN 978-1-4601-5389-5. Available at: https://open.alberta.ca/publications/evaluation-of-quality-control-data-from-albertas-lotic-water-monitoring-programs.